

REMARKS

Reconsideration and allowance of the present application based on the following remarks are respectfully requested.

The specification has been amended to include proper part reference numbers and to correct certain informalities. Claim 1 has been amended. Accordingly, after entry of this amendment, claims 1-11 will be pending.

In the Office Action dated January 2, 2003, the drawings were objected to because on page 10 of the drawings, the heading for Figure 11 was not present because the margins were not proper. The Applicants respectfully request that Figure 11 contained in the Request for Approval of Drawing Corrections be approved. The page containing FIGs. 10a, 10b, 11 has been corrected to reflect proper margins. No new matter has been introduced. The Applicants respectfully request that the objection be withdrawn.

In the Office Action, the drawings were objected to under 37 C.F.R. § 1.83(p)(5) for not including the reference signs W, 108 that are mentioned in the description. The specification has been amended to replace 'W' with "W1, W2." The Applicants respectfully point to Figure 13 which shows element 108 and also Applicants respectfully request that Figure 2 contained in the Request for Approval of Drawing Corrections be approved. Reference sign 108 has been added to Figure 2. No new matter has been introduced. Accordingly, the Applicants respectfully request that the objection to the drawings be withdrawn.

In the Office Action, the drawings were objected to under 37 C.F.R. § 1.83(p)(5) for including the reference signs 211a, 213a, 710 that are not mentioned in the description. The Applicants respectfully request that Figures 13 and 16 contained in the Request for Approval of Drawing Corrections be approved. Reference signs 211a, 213a have been deleted from Figure 13 and reference sign 710 has been deleted from Figure 16. No new matter has been introduced. Accordingly, the Applicants respectfully request that the objection to the drawings be withdrawn.

In the Office Action, claims 1-11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Haney et al. (United States Patent No. 6,333,775), and further in view of Furukawa et al. (United States Patent No. 4,993,696). The Applicants respectfully traverse this rejection.

Claims 1, 9, and 11, and the claims that depend from them, are patentably distinguishable from Haney et al. in view of Furukawa et al. because the claims recite a combination and method, respectively, that include, for example, a conduit *shield* that separates the vacuum chamber from the space that includes the conduit. In contrast to the claimed invention, both Haney et al. and Furukawa et al. fail to disclose a conduit *shield*.

Haney et al. merely describes the use of different metrology trays to separate the vacuum chamber into different pressure zones within the vacuum chamber. (Haney et al. at Abstract, col. 3, lns. 33-39, col. 5, lns. 21-25). As conceded in the Office Action, Haney et al. does not teach the use of a conduct shield. Furukawa et al. merely describes the use of conduits (i.e., metal pipes) for the supply and exhaustion of an operating fluid or gas in a vacuum environment. (Furukawa et al. at col. 2, lns. 23-29). No where does Furukawa et al. teach the use of a conduit *shield*. Thus, if one of the metal pipes of Furukawa et al. ruptured, there would be no shield to prevent the fluid or gas from immediately entering the vacuum chamber and causing severe contamination.

As a result, even if there was motivation to use the metal pipes of Furukawa et al. in the vacuum chamber of Haney et al., which the Applicants do not concede, the combination of Haney et al. and Furukawa et al. do not teach or suggest each and every feature recited by claims 1, 9, and 11, and as a result, a *prima facie* case of obviousness cannot be made. Accordingly, the Applicants respectfully submit that claims 1, 9, and 11, and the claims that depend from them, are patentable over Haney et al. in view of Furukawa et al. and respectfully request that the rejection be withdrawn.

Further, although it is asserted in the Office Action that "it is known in the field to use a conduit for the purpose of separation as well as for introducing gas" (pg. 3, lns. 6-7), the Applicants respectfully point out that it is the conduit *shield* that is separating the first vacuum region from the second vacuum region, not the conduit itself. The conduit itself provides separation between the utility being communicated and the conduit shield.

Regarding comments made in reference to claims 2-8, the Applicants respectfully submit that claim 2 claims that the conduit shield includes a *conduit conduct* to guide and shield the at least one conduit. Thus, the "optimum conduction of material" has nothing to do with claims 2-8.

In view of the foregoing, the claims are believed to be in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best


resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Attached is a marked-up version of the changes made to the specification by the current amendment. The attached Appendix is captioned **"Version with markings to show changes made"**.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

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Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

On page 5, paragraph [0011]:

[0011] To circumvent this problem it has been proposed in US 4,993,696 to use metal pipes made of stainless material for the supply and exhaustion of an operating fluid or gas in a vacuum ambience. Two adjacent pipes may then be coupled with each other by a joint, which is arranged to allow swingable movement of one of the pipes relative to the other. The [(metal pipes)] will not suffer from outgassing as the nylon conduits will do. A disadvantage of the joints is that it is very difficult to design joints that are totally closed for fluids or gases in a vacuum environment. Therefor there may be leakage of gases through the joint to the vacuum environment [what] that will contaminate the vacuum environment.

On page 7, paragraph [0018]:

[0018] According to a second aspect of the present invention there is provided a device manufacturing method comprising the steps of:

providing a substrate that is at least partially covered by a layer of radiation-sensitive material;

providing a vacuum to a first vacuum chamber;

providing utilities through conduits to at least one component moveable in at least a first direction in said first vacuum chamber;

projecting a projection beam of radiation using a radiation system through said vacuum chamber;

using patterning structure to endow the projection beam with a pattern in its cross-section;

projecting the patterned projection beam of radiation onto a target portion of the layer of radiation-sensitive material,

characterized in that the method comprises the steps of:

shielding said vacuum in said vacuum chamber with a conduit shield from said conduits,

moving said conduit shield so as to follow the moveable component; and

providing a second vacuum in a space comprising the conduits and separated by the conduit shield from said vacuum chamber.

On page 10, paragraph [0039]:

[0039] Figure 1 schematically depicts a lithographic projection apparatus 1 according to the invention. The apparatus comprises:

- a radiation system LA, IL for supplying a projection beam PB of radiation (e.g. UV or EUV radiation, electrons or ions);
- a first object table (mask table) MT provided with a first object (mask) holder for holding a mask MA (e.g. a reticle), and connected to first positioning means PM for accurately positioning the mask with respect to item PL;
- a second object table (substrate table) W2T provided with a second object (substrate) holder for holding a substrate W2 (e.g. a resist-coated silicon wafer), and connected to second positioning means P2W for accurately positioning the substrate with respect to item PL;
- a third object table (substrate table) W3T provided with a third object (substrate) holder for holding a substrate W3 (e.g. a resist-coated silicon wafer), and connected to third positioning means P3W for accurately positioning the substrate with respect to item PL; and
- a projection system ("lens") PL (e.g. a refractive or catadioptric system, a mirror group or an array of field deflectors) for imaging an irradiated portion of the mask MA onto a target portion C of the substrate [W] W2, W3.

On page 15, paragraph [0055]:

[0055] A "swap" operation, in which the second object table [130] W2T moves from one of the exposure 200 and measuring 300 areas to the other area and the third object table W3T moves in the opposite direction, is depicted schematically in Figures 4 and 5. Although Figures 4 and 5 illustrate one combination of movements which result in so-called "swap", the sequence of movements could be in a different order.

On page 15, paragraph [0056]:

[0056] As shown in Figure 4, if swap is to be initiated, the first step is the translation of the second joint 105, 155 of both first and second conduit conducts. In the case of the second object table W2T, the second joint 105 of the first conduit conduct 100 moves from its second position 102 to a first position 101 which is positioned closer to the exposure area 200 than to the measuring area 300. During this operation, the second object table W2T remains substantially within the measuring area 300 and it may move within that area. In the case of the third object table W3T, the second joint 155 of the second conduit conduct 150 moves from the first position 151 to a second position 152 while the third object table [180] W3T remains substantially on the exposure area 200.

IN THE CLAIMS:

1. (Amended) A lithographic projection apparatus comprising:
  - a radiation system to provide a projection beam of radiation;
  - a first object table adapted to support patterning structure which can be used to pattern the projection beam according to a desired pattern;
  - a second object table to hold a substrate;
  - a vacuum chamber provided with a first vacuum generator constructed and arranged to provide a vacuum beam path for the projection beam;
  - a projection system to project the patterned beam onto a target portion of the substrate;
  - at least one conduit communicating a utility to a component of said lithographic projection apparatus moveable in at least one degree of freedom in said vacuum chamber;
  - a conduit shield substantially enclosing a space comprising the at least one conduit and substantially separating said vacuum chamber from [a] the space comprising the at least one conduit, said conduit shield being constructed and arranged to allow for movement of the component in said at least one degree of freedom, and
  - a second vacuum generator constructed and arranged to provide a vacuum in the space comprising the [conduits] at least one conduit.

End of Appendix